REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended claim 1 to recite that the material includes graphite particles, each having a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, each of the graphite particles having the specified aspect ratio and volume of fine pores, and each of the graphite particles having a surface; and with a layer of carbon formed on the surface of each of the graphite particles. Thus, claim 1 more clearly defines the graphite particles relative to the fine particulate, defining structure of the graphite particles. Moreover, claims 5, 8 and 9, withdrawn from consideration in the Office Action mailed April 14, 2009, have been cancelled without prejudice or disclaimer, and in particular, without prejudice to the filing of a Divisional application directed to the subject matter thereof.

Furthermore, Applicants are adding new claims 12-14 to the application. Claims 12 and 13, each dependent on claim 1, respectively recites that the layer consists essentially of carbon, and consists of carbon. Claim 14, also dependent on claim 1, recites that the layer of carbon covers the respective graphite particle.

The restriction requirement set forth in Item 1 on pages 2 and 3 of the Office Action mailed April 14, 2009, is noted. Applicants have cancelled claims 5, 8 and 9, drawn to the non-elected invention as set forth in the paragraph bridging pages 2 and 3 of the Office Action mailed April 14, 2009, without prejudice or disclaimer. Accordingly, it is respectfully submitted that the restriction requirement is now moot. In any event, in light of the requirement for affirmation in the paragraph bridging pages 2 and 3 of this

Office Action mailed April 14, 2009, Applicants affirm their election of the Group I claims, including claims 1-4, 6, 7, 10 and 11. In this regard, it is respectfully submitted that the Examiner errs in indicating, on page 2 of the Office Action mailed April 14, 2009, that claims 1-4 and 6-11 are drawn to a negative electrode material; it is respectfully submitted that claims 8 and 9 are directed to a method of making a negative electrode material, as recognized by the Examiner in lines 1-3 on page 3 of this Office Action mailed April 14, 2009.

Rejection of claim 1 under the second paragraph of 35 USC 103, set forth in Item 3 on pages 3 and 4 of the Office Action mailed April 14, 2009, is noted. While Applicants clearly define the block-like graphite particle in paragraph [0019] bridging pages 9 and 10 of Applicants' specification, in order to facilitate proceedings Applicants are deleting the term "block-like" from their claims, defining graphite particles each having a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other. In view of this amendment of claim 1, it is respectfully submitted that the rejection of claim 1 under the second paragraph of 35 USC 112 is moot.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed April 14, 2009, that is, the teachings of U.S. Patent Application Publication No. 2001/0033822 to Ishii, et al., and Japanese Patent Document No. 2000-203818 to Takei, et al., under the provisions of 35 USC 103.

It is respectfully submitted that the teachings of these references as applied by the Examiner would have neither taught nor would have suggested such a nonaqueous electrolyte secondary battery negative electrode material, or the nonaqueous electrolyte secondary battery negative electrode or nonaqueous electrolyte secondary battery using such material/negative electrode, as in the present claims, including, inter alia, wherein the graphite particles, as in the present claims, each having a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, have a layer of carbon formed on the surface of each of the graphite particles, with a ratio (by weight ratio) of the layer of carbon to a respective graphite particle being in the range of 0.001-0.01; and wherein the graphite particles have a volume of five pores in the range of 10 to 10^5 nm in a volume of 400 to 2000 cm^3/kg. See claim 1.

More particularly, it is respectfully submitted that the teachings of these applied references would have neither disclosed nor would have suggested such material as in the present claims, having the layer of carbon with the weight ratio of the layer of carbon to a respective graphite particle as in the present claims, and wherein this layer "consists essentially of" (see claim 12), or "consists of" (see claim 13), carbon; and/or wherein the carbon covers the respective graphite particle (see claim 14).

In addition, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such material as in the present claims, having the layer of carbon with weight ratio of layer of carbon to the respective graphite particle, and the volume of fine pores, as in claim 1, and, additionally, wherein the material has features as in the remaining dependent claims, including average particle diameter, true specific gravity, bulk density, specific surface

area and Raman spectrum analysis R value as in claim 2; and/or slurry viscosity as in claims 3 and 10; and/or bulk density and rate of variation of bulk density as in claims 4 and 11.

The present invention relates to material for a negative electrode of a nonaqueous electrolyte secondary battery, and the negative electrode and the secondary battery formed respectively using such material and such negative electrode. The nonaqueous electrolyte secondary battery formed using such electrode and material can suitably be used in portable electronic devices, electric automobiles, electricity storage or the like.

Graphite particles for negative electrode material, where a plurality of flat particles are assembled or bonded so that a plurality of alignment surfaces may be non-parallel with each other, have been proposed, as described in the paragraph bridging pages 3 and 4 of Applicants' specification. However, as described in the first four lines on page 4 of Applicants' specification, there is a problem that the charging capacity (charge load characteristics) when the battery using such graphite particles is charged at a high speed, is low.

While, as described in the sole full paragraph on page 4 of Applicants' specification, it has been disclosed to coat a surface of graphite particle with low crystalline carbon, the published application disclosing such coating does not mention any advantage in connection with charge load characteristics.

Against this background, Applicants provide negative electrode material for a nonaqueous electrolyte secondary battery which has excellent discharge capacity, charge/discharge efficiency and charge load characteristics. Applicants have found that

by providing a layer of carbon on the surface of each of the graphite particles which have a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, with a ratio (by weight ratio) of the layer of carbon to the respective graphite particle being in a range of 0.001-0.01, objectives according to the present invention are achieved. That is, as described in the paragraph bridging pages 8 and 9 of Applicants' specification, when the ratio of the carbon layer to graphite particle is less than 0.001, an improvement width in the charge load characteristics is small; while when the ratio exceeds 0.01, the initial charge/discharge efficiency is deteriorated. By providing the weight ratio as in the present claims, charge load characteristics are excellent, with excellent initial charge/discharge efficiency.

In addition, the presently claimed subject matter includes graphite particles having a volume of fine pores in the range of 10-10^5 nm in a volume of 400-2000 cm^3/kg. When the volume of pores in the range is less than 400 cm^3/kg, the discharge load characteristics and the discharge capacity tend to decrease, while, on the other hand, when the volume exceeds 2000 cm^3/kg, the cycle characteristics tend to deteriorate. Note the paragraph bridging pages 9 and 10 of Applicants' specification.

As to advantages achieved by the present invention, note also the paragraph bridging pages 21 and 22 of Applicants' specification.

In connection with advantages achieved according to the present invention, note, in particular, Table 4 on page 31 of Applicants' specification, particularly Examples 1-4 of the present invention as compared with Comparative Examples 2 and 3, respectively containing ratios greater than, and less than, the ratio range in the present claims. As stated in the first paragraph on page 32 of Applicants' specification, it can be seen that

material according to the present invention is excellent in discharging capacity, charge/discharge efficiency and charge load characteristics.

Takei, et al. discloses composite carbon particles containing a graphite part, an amorphous carbon part and silicon, the composite carbon particle being produced by mixing a graphitic particle with an organo silicon compound and a carbon precursor, heating the resultant mixture and decomposing and carbonizing the organo silicon compound and carbon precursor. Note the English language abstract of Takei, et al. Note also paragraphs [0011] and [0012] of this patent document, describing, inter alia, that the graphite particles are graphite particles in which flat-shaped particles gather or combine with non-parallel relationship.

As recognized by the Examiner, e.g., in the first full paragraph on page 5 of the Office Action mailed April 14, 2009, Takei, et al. would have neither disclosed nor would have suggested such features of the present invention including, inter alia, the ratio (by weight ratio), or pore volume, as in the present claims.

Moreover, it is respectfully submitted that Takei, et al. would have neither disclosed nor would have suggested, and in fact would have taught away from, such material as in the present claims, wherein the layer consists essentially of carbon (see claim 12), or consists of carbon (see claim 13), as in various of the present claims. In this regard, it is noted that Takei, et al. requires silicon in the material covering the graphite grains.

It is respectfully submitted that the additional teachings of Ishii, et al. would not have rectified the deficiencies of Takei, et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Ishii, et al. discloses graphite particles for use in a negative electrode for lithium secondary batteries, the graphite particles being obtained by assembling or binding together a plurality of flat-shaped particles so that the planes of orientation do not become parallel to one another. Note, in particular, paragraphs [0013] and [0014] on page 1 of this patent publication. As applied by the Examiner, note also paragraphs [0065] and [0071]-[0075] on page 5 of this patent document, disclosing that the graphite paste used in forming the negative electrode for the lithium secondary battery includes an organic binder, which organic binder can be polyethylene, polypropylene, ethylene-propylene terpolymer, butadiene rubber, styrene-butadiene rubber, butyl rubber, polymeric compounds having a high ionic conductivity, and the like.

Contrary to the contention by the Examiner, it is respectfully submitted that the combined teachings of Takei, et al., and Ishii, et al., would have neither disclosed nor would have suggested the presently claimed invention, including, inter alia, the layer of carbon on the surfaces of the graphite particles and with the ratio (by weight ratio) of the layer of carbon to a respective graphite particle.

In this regard, the contention by the Examiner that Ishii, et al. would have disclosed or would have suggested, in combination with the teachings of Takei, et al., such ratio of a layer of carbon formed on the surface of each of the graphite particles, is respectfully traversed. As applied by the Examiner, Ishii, et al. discloses a binder. Ishii, et al. discloses that a mixing ratio between the graphite particles and the binder (not a layer of carbon formed on the surface of each of the carbon particles) is utilized in the recited amount by weight, per 100 parts by weight of graphite particles. It is respectfully

submitted that the binder in Ishii, et al. is used for bonding graphite particles with each other, and not for forming a layer on a surface of the graphite particle. It is respectfully submitted that such binder disclosed in Ishii, et al., would have neither disclosed nor would have suggested the layer of carbon formed on the surface of the graphite particles as in the present claims, much les in the weight ratio as in the present claims, and advantages achieved thereby.

Thus, it is respectfully submitted that the binder in Ishii, et al., is a binder necessary to produce negative electrode material for a secondary battery, and is used to bond between a negative electrode material and a current collector. It is respectfully submitted that this binder material is not for forming a layer of carbon on a surface of the graphite particles.

As Ishii, et al. discloses a binder material for, e.g., bonding the graphite particles to a current collector, amount of binder as disclosed in Ishii, et al. would have neither taught nor would have suggested the weight ratio of carbon layer to graphite particle as in the present claims, and advantages thereof.

Thus, while the Examiner relies on the teachings of Ishii, et al. as disclosing the weight ratio in the present claims, as discussed on page 6 of the Office Action mailed April 14, 2009, in view of the purpose of the binder in Ishii, et al., including its purpose of binding to the current collector, it is respectfully submitted that the teachings of Ishii, et al., even in combination with the teachings of Takei, et al., would have neither disclosed nor would have suggested the presently claimed subject matter, including, inter alia, weight ratio of the layer of carbon to the graphite particles, on the surface of the

graphite particles, in particular covering the graphite particles, and advantages achieved thereby.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently being considered on the merits in the above-identified application are respectfully requested.

To the extent necessary, Applicants hereby petition for an extension of time under 37 CFR 1.136. Kindly charge any shortage of fees due in connection with the filing of this paper, including any extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (case 1204.46017X00), and please credit any overpayments to such Deposit Account.

Respectfully submitted,

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